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Please read this manual thoroughly and follow the **Installation** procedures to prevent any damage to the unit or any connecting device.

- *The final specifications are the actual product based.*
- *Features and functions are subject to change since the manual was written. Please visit the related website to download the latest version of manual for reference.*
- *Any other trademarks mentioned in this manual are acknowledged to be the property of the trademark owners.*

FC CE VCI **RoHS**

---------- *Introduction*

This User's Manual is suitable for

HDMI over Giga LAN Extender (NXMU-M220)

DVI over Giga LAN Extender（NXDU-M220）

It is divided into 2 parts:

Part 1: Uni-Cast Configuration

Part 2: Multi-Cast (Multi-to-Multi) Configuration

The Uni-Cast application is Plug-and-Play basis. It's easy to install in seconds.
The Multi-Cast application can be used as multi-to-multi.

	Occasion	advantage	disadvantage
Uni-Cast	one on one control & broadcast	■ Plug-and-play basis ■ Via existing LAN system ■ Save bandwidth ■ Multi-channel can be transmitted simultaneous	◆ Rotary DIP switch must be paired ◆ Only one on one
Multi-Cast	multiple to multiple control & broadcast	■ Single / Multi channels broadcasting simultaneous ■ Multi-drop	◆ Need High Bandwidth IGMP Hub

Package Content
Sender Unit and / or Receiver Unit x 1 set / pc (see Ordering Information)
CAT5 cable (for testing)
Plastic Screw Driver x 1
CD with User's Manual
Foot Pad Set
Optional
Mounting Bracket with Screws
RJ11 to RS232 Converter
Power Adapter (see Ordering Information)

Power Adapter is optional for extender with PoE function.

Ordering Information

Model	Type	Optional Power Adapter
NXDU-M220	Sender Unit and Receiver Unit	2
NXDU-220L	Sender Unit	1
NXDU-220R	Receiver Unit	1
NXMU-M220	Sender Unit and Receiver Unit	2
NXMU-220L	Sender Unit	1
NXMU-220R	Receiver Unit	1

Overview

The **HDMI over Giga LAN Extender** is a perfect solution for audio and video signal extension via existing LAN (Local Area Network) system. It's Plug-and-Play basis in uni-cast application, neither GUI control nor RS232 setup is required. However, you need to set an identical ID number (Rotary DIP Switch) for each Sender and Receiver unit.

With multicast technology, one local unit can drive multiple remote units with no extra network load. Via IGMP Giga Hub, there are 16 channels selectable and up to 4 channels can be transmitted simultaneously. Amazingly, each channel can be shown to an incredible 65536 displays using a standard IT Ethernet structure on a LAN system. For each source device a local unit is required, and a remote unit is needed for each display device.

The **HDMI over Giga LAN Extender** is Full HD 1080p supported, HDCP compliant and Blu-ray ready. Moreover, this has been common used in applications that require greater distance, high speed transmission, real-time high video resolution, security, and noise immunity. Based on Giga LAN structure, it supports super-high speed transmission. It is ideal for situations that need live presentation, such as public broadcasting, education center, boardrooms, etc.

Features

- Extend high definition video signal over LAN, depending on performance network
- Extend USB signal transmission by using the existing LAN system without additional wiring
- Suitable for most of popular USB devices (e.g. USB sticks, USB printers, USB Scanner, external hard disk drives etc.)
- 16 selections on the DIP rotary DIP switch available for pairing
- Up to 4 pairings can be transmitted simultaneously over the Giga LAN System
- Using Giga LAN system for low latency network and well-grouping management
- Automatic EDID configuration
- PoE function supported, no additional power supply for the extender unit
- Well-developed Ethernet technology and TCP/IP communication protocol
- HDCP-compliant and Blu-ray ready
- HDTV compatible; support 1080p, 1080i, 720p, 720i
- Compatible with most of the popular screen resolution to XGA, SXGA, UXGA, WSXGA⋯.Full HD system
- Optional VESA mounting bracket supported (for VESA mountable display attachment)

System Requirement

1. HDCP compliant monitors with HDMI interface for the HDCP video source
2. CAT5 / 5e / 6 UTP cable (EIA / TIA 568B industry standard compliant)
3. Ethernet Hub (Giga Ethernet Hub is recommended)

System Requirement for PoE

1. Ensure that a PSE device supports PoE function.
2. Ensure that a PSE device can provide sufficient power on the Ethernet cable.
3. STP and FTP cabling are recommended.

Relative Product

Model	Function	PoE	
NVXM-M110	Uni-Cast	N/A	(NVXM-110L + NVXM-110R)
NVXM-M130	Multi-Cast, Video Wall	N/A	(NVXM-130L + NVXM-130R)
NVXM-M210	Uni-Cast	Yes	(NVXM-210L + NVXM-210R)
NVXM-M230	Multi-Cast, Video Wall	Yes	(NVXM-230L + NVXM-230R)

For more information, please check through this manual.

---------- Part 1: Uni-Cast Configuration

I. Installation

1. Device Connection

WARNING!

- Ensure that all devices are powered off before connecting to the Unit.
- Make sure all devices you will connect are properly grounded.
- Place cables away from fluorescent lights, air conditioners, and machines that are likely to generate electrical noise.
- Please allow adequate space around the unit for air circulation.

1. Connect the video source to the Sender Unit.
2. Connect the monitor to the Receiver Unit.
3. Use CAT5 cables (EIA / TIA 568B industry standard compliant) for connection between Tx/Rx and LAN Hub.
4. Set an identical ID number on Rotary DIP Switch for both Units.
5. Apply the proper power to all connecting devices.

NOTE:

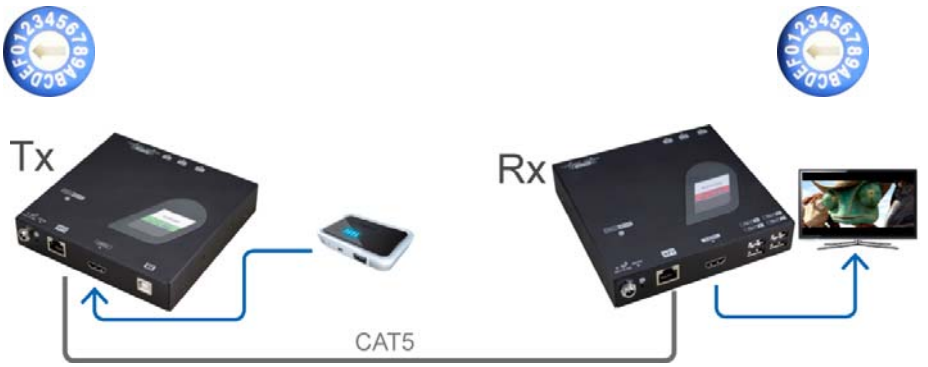
A). It is highly recommended using Giga Ethernet Hub for optimal transmission quality.

B). If users encounter no screen display in computer connection:

1. Make sure the device cables are correctly and firmly attached.
2. Set your display device's (TV, monitor, etc.) input source as HDMI.
3. Check the PC BIOS configuration about the video output setting.
4. Connect your computer to the HDMI Display DIRECTLY to check if the video signal gets through.
5. Set the Rotary DIP Switch to the correct position.
6. Inappropriate EDID data. Apply EDID Copy to your display (see EDID Configuration section).
7. HDCP issue. The system will disable the video output signal when it detects non-HDCP compliant display(s) on playing the HDCP video source. All the connected output displays MUST be HDCP compliant while the video source is HDCP compliant.

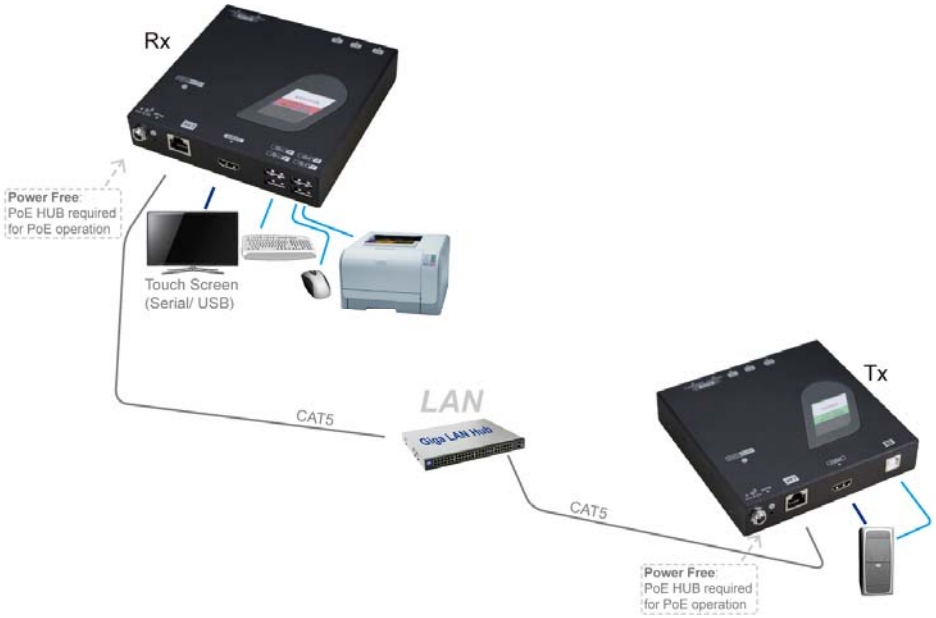
2. Connection Pattern

Single Point-to-Point Application



Function as simple video extenders, without Ethernet Hub in between

■ Sender's and Receiver's rotary DIP switch should be adjusted on the same position.



II. Product Description

Ub		USB Connector	USB Host connection
	Ua		USB device(s) connection
T1		Video Connector	Connect to the HDMI source
	R1		Connect to the HDMI monitor
T2	R2	RJ-45 Jack	Connect to an Ethernet Hub
T3	R3	Reset Button	System reset
T4	R4	Power Supply	Apply the proper power to the unit
T5	R5	F2 Push Button	*See Push Button Control section*
T6	R6	F1 Push Button	
T7	R7	Rotary DIP Switch	Set up ID numbers
T8	R8	Serial Port 1	For system control
T9	R9	Serial Port 2	For data communication
T10	R10	Network Status LED	Flashing: Connected to network Off once: Abnormal
T11		Power/Link LED	Green: Unlink / Blue: Link OK Flash Blue + Green: Linked but no video source input
	R11		Red: Unlink / Blue: Link OK Flash Blue + Red: Linked but no video source input

III. Operation

The LEDs on the Extender Units show the real-time status indicating the linking and communication between the Sender Unit and the Receiver Unit. Users can identify the current status through the LED indicators on the unit.

The quality of the output signal will depend largely upon the quality of video source, cable and display device used. Low quality cables degrade output signal causing elevated noise levels. Please use the proper cable and make sure the display device is capable of handling the resolution and refresh rate selected.

NOTE:
The system will disable the video output signal when it detects non-HDCP compliant display(s) on playing the HDCP video source. All the connected output displays MUST be HDCP compliant, when the video source is HDCP compliant.

1. Setting

User needs to do the first thing setting Unicast mode in the browser because factory default is Multicast Mode.

1.1 How to set Unicast for Sender

A). **Domain Name**

The first thing users need to do is setting the unit as Uni-cast mode via browser because the factory default setting is Multi-cast mode. Identical ID setting on the rotary DIP switch of both Sender and Receiver is essential. Open web browser and insert the address. Please see the “Network Configuration” section.

B). **IP**

Open web browser and insert Sender’s IP address. If you don’t know IP address, you could find on the corner of Host Selection. Please see the “Network Configuration” section.

C). **Serial Command**

1.2 How to set Unicast for Receiver

A). **IP**

Open web browser and insert Receiver’s IP address. If you don’t know IP address, you could find on the corner of Host Selection. Please see the “Network Configuration” section.

B). **Serial Command**

For more detail, please follow Network Configuration.

2. Push Button Control

VIDEO Extender over Giga LAN		
Tx	F1	● Press once (click within 0.3 sec.) - Link/ Unlink video (also functions for all Tx & Rx in the same channel)
		● Factory Default Setting for Tx: Power off the unit → Press and hold the button → Power on the unit → Release the button after 17 sec. right after the Power/Link LED flashes green & blue) → Re-power the unit
	F2	● Press for 1 sec. - Select Graphic Mode or Video Mode (also functions for all Tx & Rx in the same channel) (Factory default: Graphic Mode)
		● Press for 3 sec. – Enter Anti-Dither Adjustment Mode: Level 1 /Level 2 / Off (also functions for all Tx & Rx in the same channel) (Factory Default: Off)
	Reset	● Reboot the system
Rx	F1	● Press once (click within 0.3 sec.) - Link/ Unlink video (also functions for all Tx & Rx in the same channel)
		● Press and hold – USB port function enable/ disable
		● Factory Default Setting for Rx: Power off the unit → Press and hold the button → Power on the unit → Release the button after 17 sec. right after the Power/Link LED flashes red & blue) → Re-power the unit
	F2	● Press for 1 sec. - Select Graphic Mode or Video Mode (also functions for all Tx & Rx in the same channel) (Factory default: Graphic Mode)
		● Press for 3 sec. – Enter Anti-Dither Adjustment Mode: Level 1 /Level 2 / Off (also functions for all Tx & Rx in the same channel) (Factory Default: Off)
		● *EDID Copy: Power off the unit → Press and hold the button → Power on the unit → Release the button after 12 sec. (the Network Status LED flashes yellow)
	Reset	● Reboot the system

3. EDID Configuration

EDID (Extended Display Identification Data) is greatly important which contains information about manufacturer name and serial number, product type, maximum image size, color characteristics, factory pre-set timings, frequency range limits, etc. In some cases display problems may occur due to incorrect EDID communication between the display monitor and the unit or inappropriate EDID data programmed by display manufactures. Therefore, by adopting “EDID COPY” function, it will allow the system to copy EDID information from EDID compliant displays in order to assure accurate display performance.

- **EDID Copy** (on Receiver Unit only)

  Step 1. Power off the unit

  Step 2. Press and hold the button F2

  Step 3. Power on the unit

  Step 4. Release the button after 12 sec. (the Network Status LED flashes yellow)

NOTE:

1. Using HDMI or DVI for all monitors; do not mix them up in one system.
2. It is suggested using monitors with identical brand and type.

4. Network Configuration

User may want to exchange casting mode between unicast and multicast, set up IP and use EDID Copy function. There are two way to reach, browser and serial command.

2.1. To complete users' goal, configuration via browser is divided into two ways,
   a. Typing Domain Name in the address bar
   b. Typing IP in the address bar

Before starting take notice of differentiation between Domain Name and IP.

2.1.1. System configuration via Domain Name

a Domain Name is for Sender only.

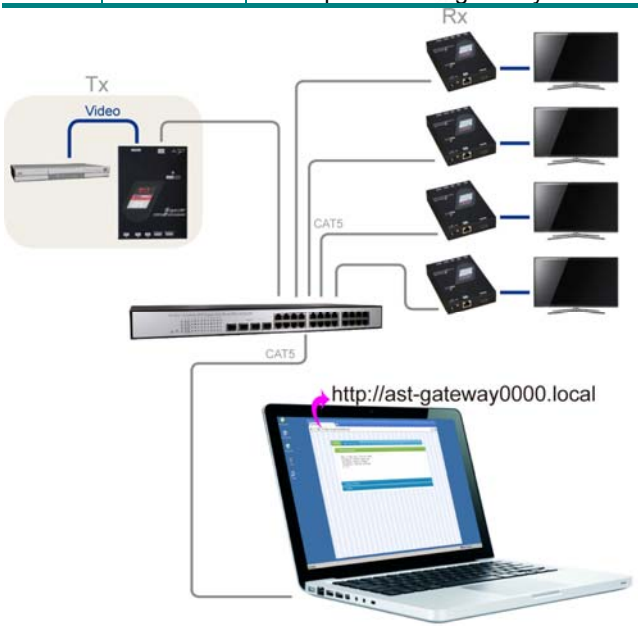
b. It is suggested using "**Safari**" web browser or other web browsers like **Google Chrome**, **Firefox** or **IE**…, etc. If you use other web browser which is not **Safari** you'll need to install "bonjour SDK": Go to the website http://developer.apple.com/opensource/ and look for "bonjour SDK download" for installation.

c. The same pair of Sender and Receiver should have identical ID (Rotary DIP Switch number)

d. Open web browser and insert the address: http://videolan-gateway0000.local

The four digits after the word "videolan-gateway" depends on the position of the Rotary DIP Switch you've set. Please refer to the form below. For example, if the position is set up as 7, then the address should be http://videolan-gateway1110.local

Rotary Switch	Four digits	Domain Name
0	0000	http://videolan-gateway0000.local
1	1000	http://videolan-gateway1000.local
2	0100	http://videolan-gateway0100.local
3	1100	http://videolan-gateway1100.local
4	0010	http://videolan-gateway0010.local
5	1010	http://videolan-gateway1010.local
6	0110	http://videolan-gateway0110.local
7	1110	http://videolan-gateway1110.local
8	0001	http://videolan-gateway0001.local
9	1001	http://videolan-gateway1001.local
A	0101	http://videolan-gateway0101.local
B	1101	http://videolan-gateway1101.local
C	0011	http://videolan-gateway0011.local
D	1011	http://videolan-gateway1011.local
E	0111	http://videolan-gateway0111.local
F	1111	http://videolan-gateway1111.local



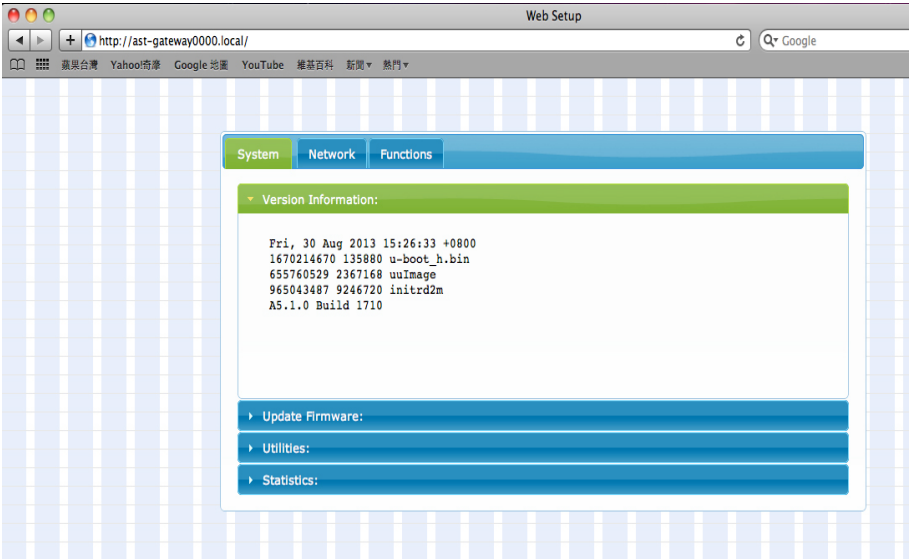
4.1.2. System configuration via IP address

a. Type a specific IP in the address bar and go to the setting page for each extender unit such as 169.254.xxx.xxx.It is suggested using "**Safari**" web browser or **Google Chrome, Firefox** or **IE.**

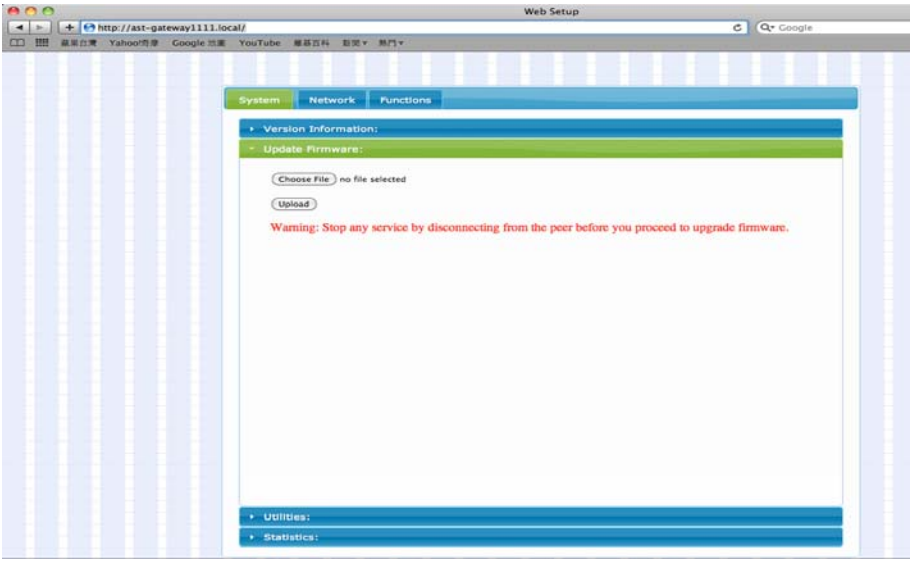
b. If users do not know Senders or Receivers IP address, find on the corner of Host Selection Page.

4.2. Insert Domain Name / IP address to set up system

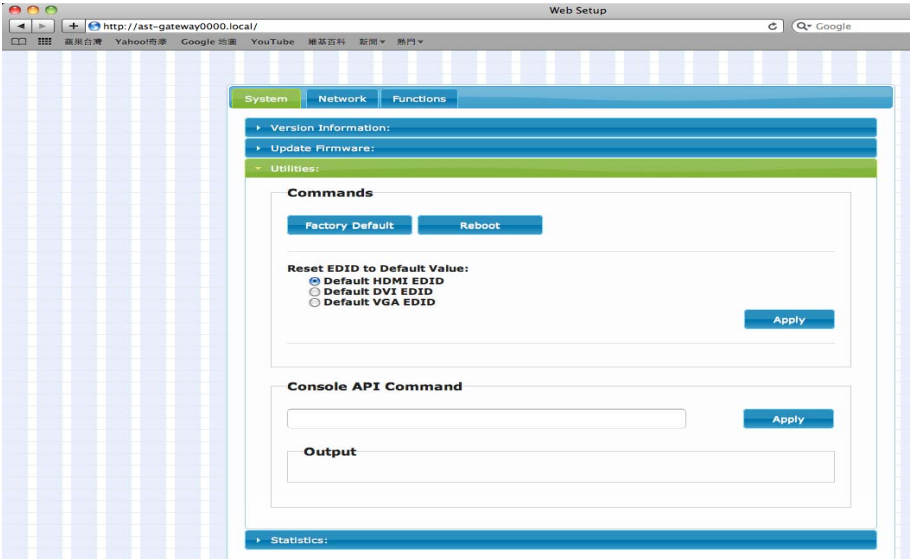
If you log in, you may see the following first. On System page, it shows the version information.



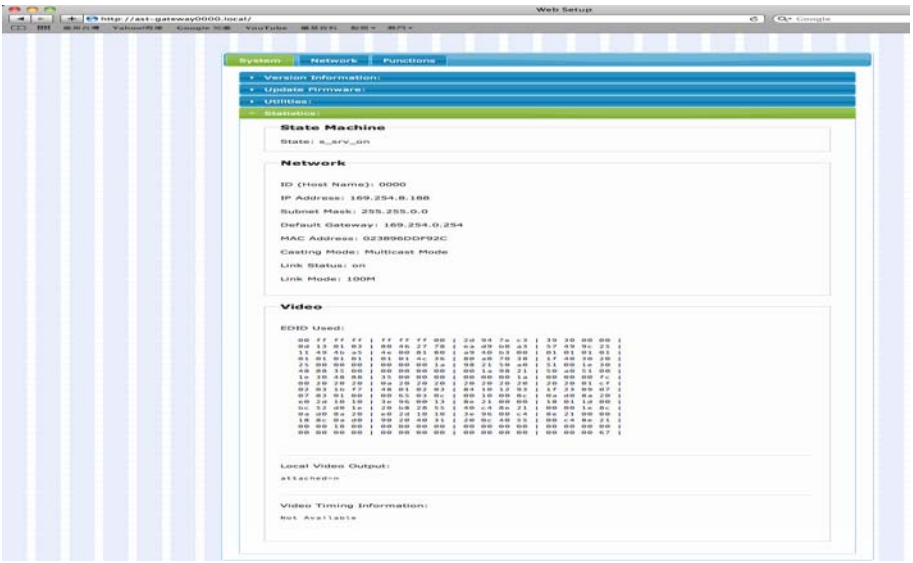
You can also see the Update Firmware having two buttons; choose file and Upload, for updating.



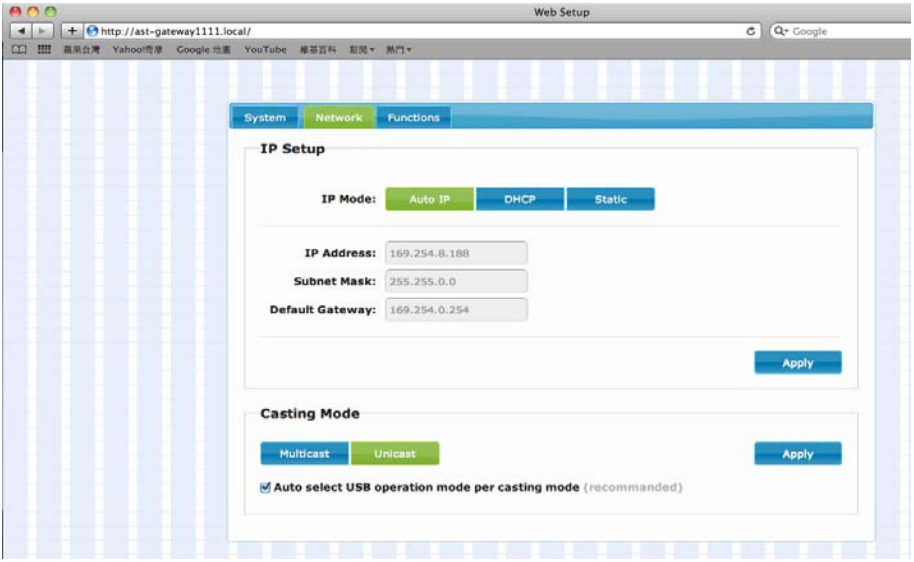
Utilities provide system rebooting and factory default setting.

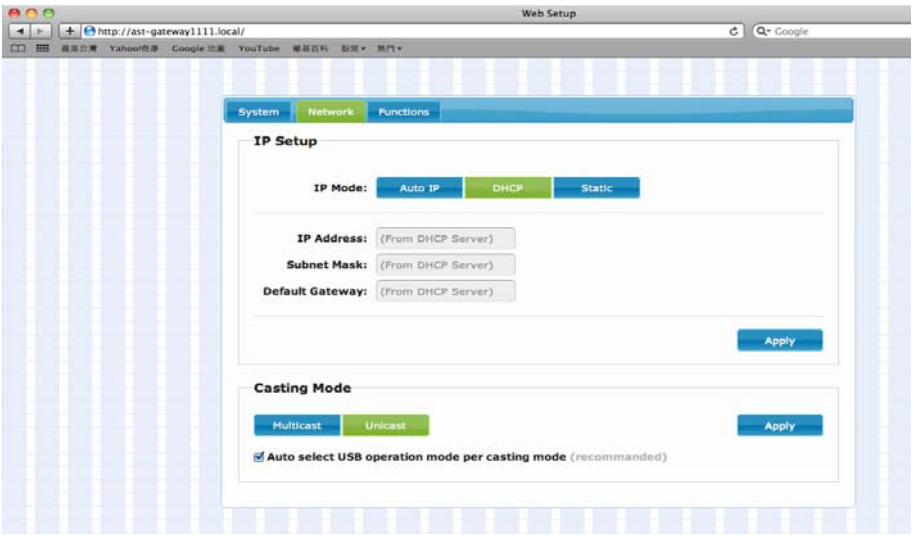


Status shows information of the Host unit such as ID, IP Address, default gateway, etc.

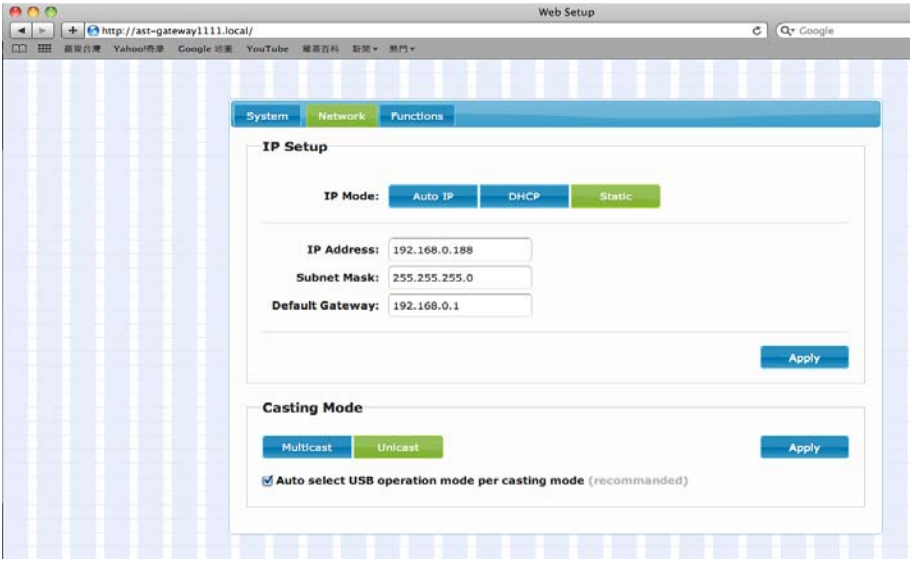


The LAN Extender can either has its IP address assigned dynamically (DHCP) or it can be given a fixed IP address.

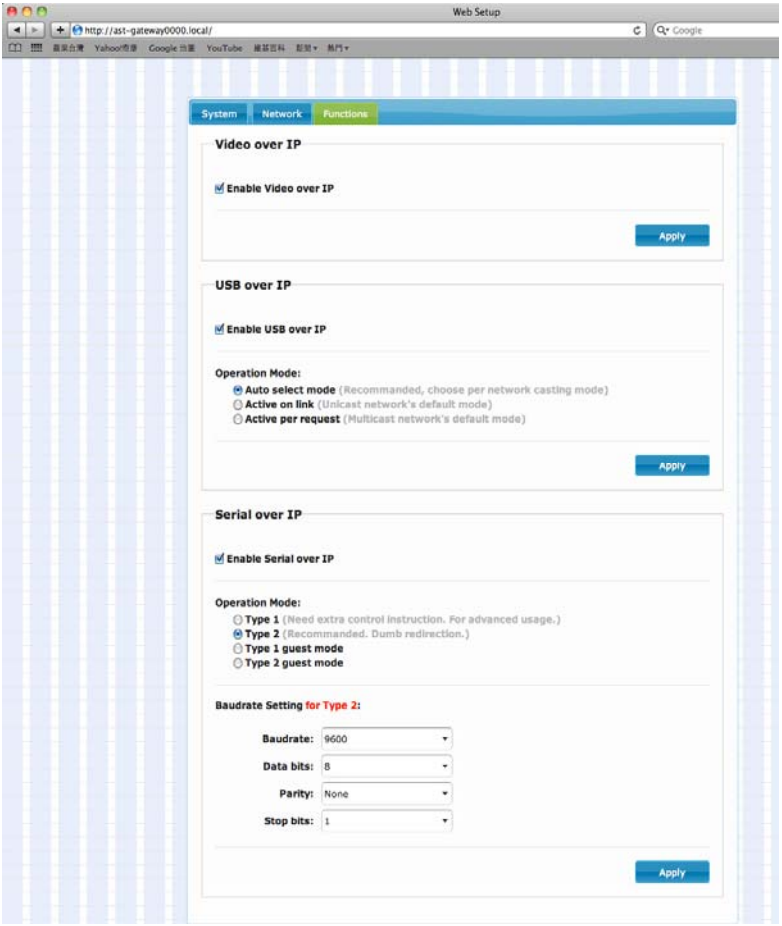




If there is no DHCP you must assign a static IP for the unit. You can get it from the networking administrator.



On Function Page, it is divided into three sections, Video over IP, USB over IP and serial over IP.

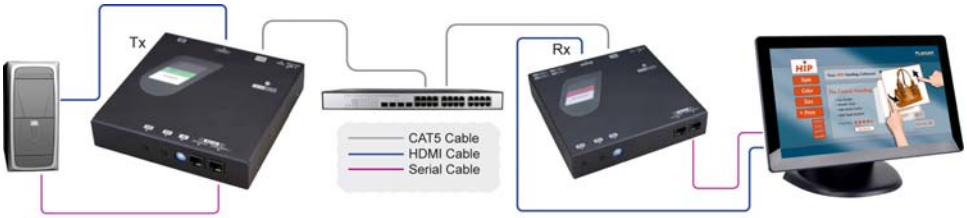


IV. Touch Screen Application

Connection Pattern

Touch Screen for USB monitor

Touch Screen for Serial monitor



---------- Part 2: Multi-Cast (Multi-to-Multi) Configuration

I. Installation

1. Device Connection

WARNING!

- Ensure that all devices are powered off before connecting to the Unit.
- Make sure all devices you will connect are properly grounded.
- Place cables away from fluorescent lights, air conditioners, and machines that are likely to generate electrical noise.
- Please allow adequate space around the unit for air circulation.

1. Connect the video source to the Sender Unit.
2. Connect the monitor to the Receiver Unit.
3. Use CAT5 cables (EIA / TIA 568B industry standard compliant) for connection between Tx/Rx and Giga Hub.
4. Set different ID number for each Sender, Receivers are not limited.
5. Apply the proper power to all connecting devices.

NOTE:

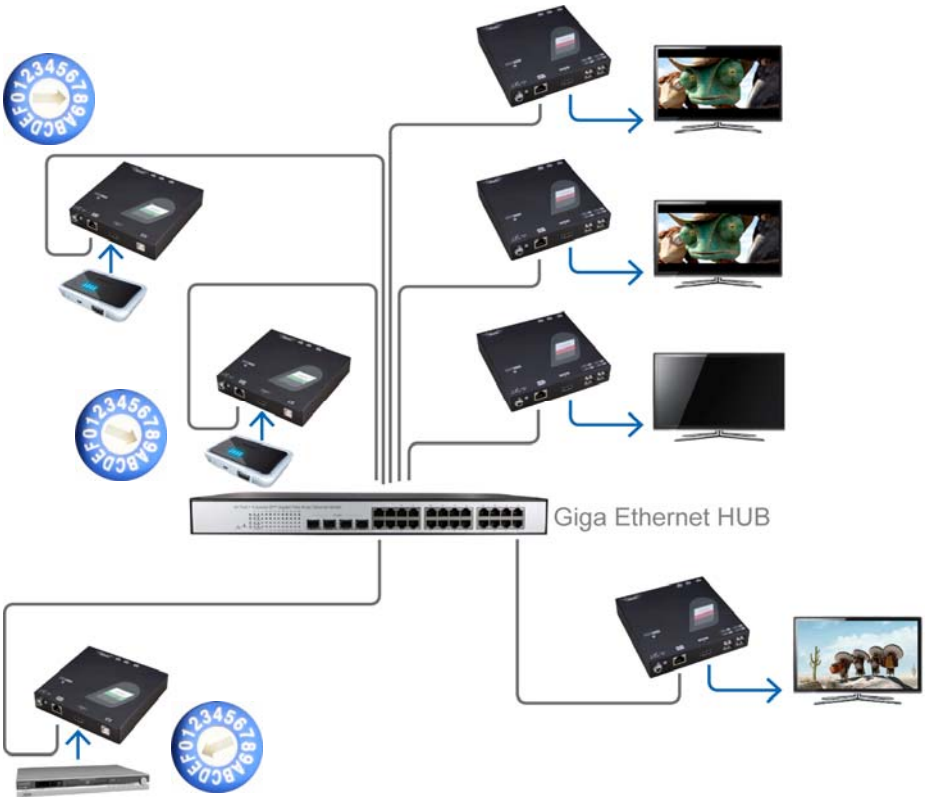
A).It is suggested using the proper Giga Ethernet Hub (IGMP) to ensure optimal transmission quality. (see *System Requirement* section)

B).If users encounter no screen display in computer connection:

1. Make sure the device cables are correctly and firmly attached.
2. Set your display device's (TV, monitor, etc.) input source as HDMI.
3. Check the PC BIOS configuration about the video output setting.
4. Connect your computer to the HDMI Display DIRECTLY to check if the video signal gets through.
5. Set the Rotary DIP Switch to the correct position.
6. Inappropriate EDID data. Apply EDID Copy to your display (see EDID Configuration section).
7. HDCP issue. The system will disable the video output signal when it detects non-HDCP compliant display(s) on playing the HDCP video source. All the connected output displays MUST be HDCP compliant while the video source is HDCP compliant.

2. Connection Pattern

Multi-To-Multi Application



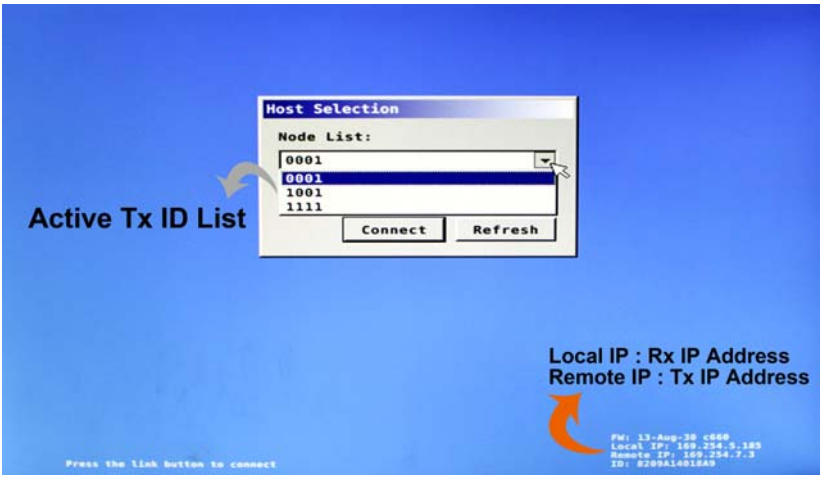
■ Each Sender's ID must be different.

3. Host Selection

After successfully connecting all of NXMU LAN extenders, you can choose one receiver (For Example, Local IP: 169.254.5.185) to play a source from Senders. When you push F1 on the receiver, you will see one message box in the frame. Node List records four digits (meant Sender's ID) that you set it before, and you can choose one to enter. (You can check the form for reference below)

Once entering this Host Selection Window, we suggest you making system renew Node List by clicking "Refresh" button.

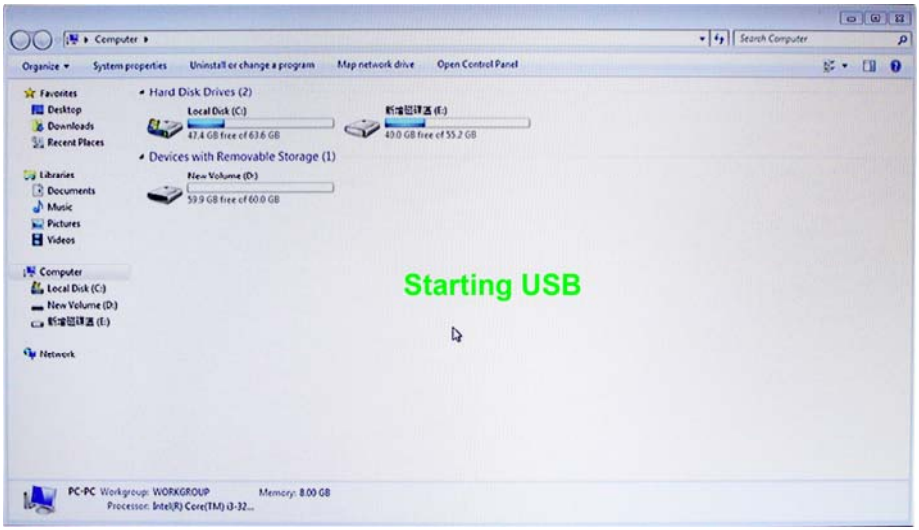
After finishing operation between sender and receiver(s), you can push F1 on your sender to disconnect other receivers.



Rotary Switch	Four digits	Domain Name
0	0000	http://videolan-gateway0000.local
1	1000	http://videolan-gateway1000.local
2	0100	http://videolan-gateway0100.local
3	1100	http://videolan-gateway1100.local
4	0010	http://videolan-gateway0010.local
5	1010	http://videolan-gateway1010.local
6	0110	http://videolan-gateway0110.local
7	1110	http://videolan-gateway1110.local
8	0001	http://videolan-gateway0001.local
9	1001	http://videolan-gateway1001.local
A	0101	http://videolan-gateway0101.local
B	1101	http://videolan-gateway1101.local
C	0011	http://videolan-gateway0011.local
D	1011	http://videolan-gateway1011.local
E	0111	http://videolan-gateway0111.local
F	1111	http://videolan-gateway1111.local

4. USB Configuration

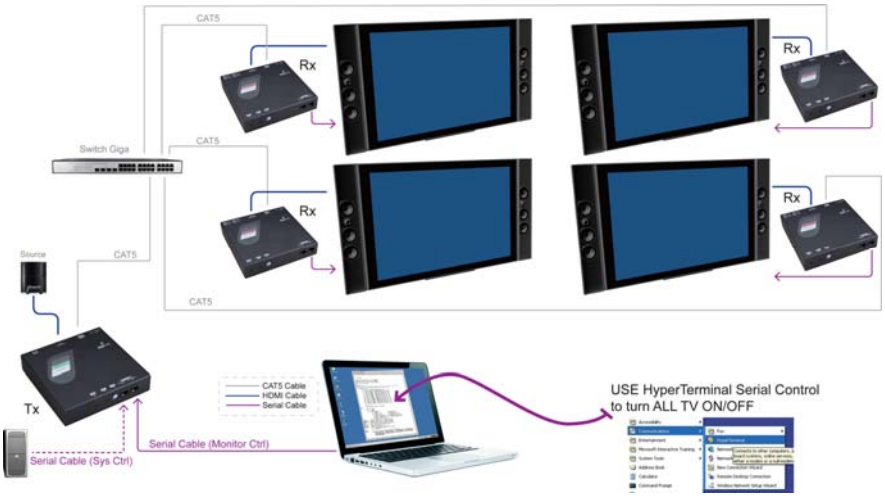
1. KB & MS activating are based on first come first served basis.
2. USB device is settled ON status by default. (Starting USB)
3. Make sure other receivers with the same sender stopping their USB device before you share your USB device.
4. Other Receivers push F1 for 3sec. on receiver side or cancel “Enable USB over LAN” to stop USB activation. (Stopping USB)



II. Touch Screen Application

Connection Pattern

Touch Screen for Serial monitor



---------- *Serial Configuration*

I. IP Setting

Telnet Host / client
telnet to IP 169.254.0.101 port 24
telnet 169.254.0.101 24
Use "root" to login.

List all boards' hostname and IP address : node_list.

Configure IP setting
Autoip : 169.254.xxx.xxx private IP domain is used and auto-generated on boot.
Dhcp client : Use DHCP client to get IP address.
Static ip : Use static IP address.
To configure IP mode : astparam s ip_mode mode
Where "mode" can be: autoip, dhcp, static

To configure static IP address :
IP : astparam s ipaddr xxx.xxx.xxx.xxx
Netmask : astparam s netmask xxx.xxx.xxx.xxx
If you want to save the setting into flash and keeps the setting after reboot:
astparam save

II. Change ID

	Rx
Stop Link	
Change multicast ip	astparam s multicast_ip 225.0.10B0.B1B2B3
Change the hostname_id	
Change the ch_select to connect to	astparam s ch_select B0B1B2B3
Trigger hostname change	ast_send_event -1 e_chg_hostname
Restart Link	ast_send_event -1 e_reconnect
Save	astparam s reset_ch_on_boot n
	astparam save
Reboot	reboot

B0,B1,B2,B3 are mapped to the 4-bits dip switch

B0	B1	B2	B3	ID
0	0	0	0	0
1	0	0	0	1
0	1	0	0	2
1	1	0	0	3
0	0	1	0	4
1	0	1	0	5
0	1	1	0	6
1	1	1	0	7
0	0	0	1	8
1	0	0	1	9
0	1	0	1	A
1	1	0	1	B
0	0	1	1	C
1	0	1	1	D
0	1	1	1	E
1	1	1	1	F

---------- *Specification*

	Sender Unit	Receiver Unit
	NXDU-220L	**NXDU-220R**
Video Input	DVI x 1	N/A
Video Output	N/A	DVI x 1
Top Panel LEDs (Power / Connection Status)	x 1	x 1
Video Resolution (max.)	Full HD (1920 x 1080) @ 60 Hz	
Maximum Distance	* Ethernet-based network	
LAN Type	Giga LAN	
Bandwidth	Avg. BW: 150MHz	
	Inst. BW: 650MHz	
	Static image BW: 100MHz	
System Expandability (max.)	16	1000（each ch.）
USB2.0	USB-B x 1	USB-A x 4
Serial Control	Yes	
Serial Extension	Yes	
Power Supply	DC 9~12V, 1.5A	
Power Consumption	13.5W	
Weight (g)	707	711
H x W x D (mm)	30 x 150 x 132 (each Unit)	

	Sender Unit	Receiver Unit
	NXMU-220L	**NXMU-220R**
Video Input	HDMI x 1	N/A
Video Output	N/A	HDMI x 1
Top Panel LEDs (Power / Connection Status)	x 1	x 1
Video Resolution (max.)	Full HD (1920 x 1080) @ 60 Hz	
Maximum Distance	*Ethernet-based network	
LAN Type	Giga LAN	
Bandwidth	Avg. BW: 150MHz	
	Inst. BW: 650MHz	
	Static image BW: 100MHz	
System Expandability (max.)	16	1000（each ch.）
USB2.0	USB-B x 1	USB-A x 4
Serial Control	Yes	
Serial Extension	Yes	
Power Supply	DC 9~12V, 1.5A	
Power Consumption	13.5W	
Weight (g)	600	605
H x W x D (mm)	27 x 131 x 130 (each Unit)	

Power over Ethernet: PoE HUB required for PoE operation
Power- Nominal Input: 48VDC; Input Range: 36-57VDC

NOTE:

* 3 levels of Switch Hub can be Daisy-chained for system expansion, and each switch hub can have 100 meters extension.

Limited Warranty

IN NO EVENT SHALL THE DIRECT VENDOR'S LIABILITY FOR DIRECT OR INDIRECT, SPECIAL, INCIDENTIAL OR CONSEQUENTIAL DAMAGES, LOSS OF PROFIT, LOSS OF BUSINESS, OR FINANCIAL LOSS WHICH MAY BE CAUSED BY THE USE OF THE PRODUCT EXCEEDS THE PRICE PAID FOR THE PRODUCT.

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